Amendments to the Specification

After paragraph 1.8 (the sentence that ends "panoramic image is generally static."), please insert the following paragraphs:

-- BRIEF DESCRIPTION OF DRAWINGS

Fig. 1 is a schematic diagram of an overall VTV system.

Fig. 2 is a schematic diagram of of a VTV system according to its basic configuration.

Fig. 3 is a schematic diagram of a VTV system according to an advanced configuration.

Fig. 4 is an illustration of a cylindrical virtual display field.

Fig. 5 is an illustration of a truncated spherical virtual display field.

Fig. 6 is an illustration of a virtual representation of a 4 track sound system.

Fig. 7 is an illustration of a virtual representation of an 8 track sound system.

Fig. 8 is a depiction of a VTV memory map for a system utilizing both augmented reality memory and virtual reality memory.

Fig. 9 is a VTV graphics engine diagram showing the data write side of the VTV processor.

Fig. 10 is a VTV graphics engine diagram showing the data read side of the VTV processor.

Fig. 11 is an example of an analogue video compatible VTV encoded video line shown containing digital data.

Fig. 12 is an example of an analogue video compatible VTV encoded video line shown containing audio data.

Fig. 13 is a diagram of an optical tracking system for detecting changes in position and orientation.

Fig. 14 is a diagram of an optical tracking system for detecting azimuth changes in orientation.

Fig. 15 is a diagram of an optical tracking system for detecting elevation changes in orientation.

Fig. 16 is a diagram of an optical tracking system for detecting roll changes in orientation.

Fig. 17 is a diagram of an optical tracking system for detecting forwards/backwards changes in position.

Fig. 18 is a diagram of an optical tracking system for detecting left/right changes in position.

Fig. 19 is a diagram of an optical tracking system for detecting up/down changes in position.

Fig. 20 is a block diagram of hardware for an optical tracking system according to a simplified version.

Fig. 21 is a table showing one possible configuration of VTV digital header data."

Please replace paragraph [2.3] with the following rewritten paragraph:

-- Due to constant variation of absolute planes of reference, mobile camera applications (either HMD based or Pan-Cam based) require additional tracking information

for azimuth and elevation of the camera system to be included with the visual information in order that the images can be correctly decoded by the VTV graphics engine. In such a system, absolute camera azimuth and elevation becomes part of the image frame information. There are several possible techniques for the interpretation of this absolute reference data. Firstly, the coordinate data could be used to define the origins of the image planes within the memory during the memory writing process. Unfortunately this approach will tend to result in remnant image fragments being left in memory from previous frames with different alignment values. A more practical solution is simply to write the video information into memory with an assumed reference point of 0 azimuth, 0 elevation. This video information is then correctly displayed by correcting the display viewport for the camera angular offsets. ~~The~~ One possible data format for such a system is shown in fig. 11 and fig. 21. --

Please replace paragraph [2.6] with the following rewritten paragraph:

-- In addition to this pre-scaling of the digital information, an audio control bit ~~(AR)~~ (AS) is included in each field (at line 21). This control bit sets the audio buffer sequence to 0 when it is set. This provides a way to synchronize the 4 or 8 track audio information so that the correct track is always being updated from the current data regardless of the sequence of the video ~~Page~~ page updates. --

Please replace paragraph [3.18] with the following rewritten paragraph:

-- The versatility of virtual reality memory (background memory) can be improved by utilizing an enhanced form of "blue-screening". In such a system, a sample of the "chroma-key" color is provided at the beginning of each scan line in the background field (area outside of the active image area). This provides a versatile system in which any color is allowable in the image. Thus, by surrounding individual objects with the "transparent" chroma-key color, problems and inaccuracies associated with the "cutting and pasting" of this object by the Warp Engine are greatly reduced. Additionally, the use of "transparent" chroma-keyed regions within foreground virtual reality images allows easy generation of complex sharp edged and/or dynamic foreground regions with no additional information overhead. --

Please replace paragraph [4.5] with the following rewritten paragraph:

-- The simple tracking system outlined in figs 13-19 detects only changes in position and orientation. With the addition of several retroflective targets, which can be easily distinguished from the background images using differential imaging techniques, it is possible to gain absolute reference points. Such absolute reference points would probably be located at the extremities of the environmental region (i.e. confines of the user space) however they could be placed anywhere within the real environment, provided the VTV hardware is aware of the real world coordinates of these markers. The combination of these absolute reference points and differential movement (from the image analysis data) makes possible the generation of absolute real world coordinate information at full video

frame rates. As an alternative to the placement of retroflective targets at known spatial coordinates, active optical beacons could be employed. These devices would operate in a similar fashion to the retroflective targets in that they would be configured to strobe light in synchronism with the video capture rate thus allowing differential video analysis to be performed on the resultant images. However, unlike passive retroflective targets, active optical beacons could, in addition to strobing in time with the video capture, transmit additional information describing their real world coordinates to the HMD. As a result, the system would not have to explicitly know the locations of these ~~beacon's~~ beacons as this data could be extracted "on the fly". Such ~~as~~ a system is very versatile and somewhat more rugged than the simpler retroflective configuration. --

Please replace paragraph [4.7] with the following rewritten paragraph:

-- An alternative implementation of this tracking system is possible utilizing a similar image analysis technique to track a pattern on the ceiling to achieve spatial positioning information and simple "tilt sensors" to detect angular orientation of the HMD/Pan-Cam system. The advantage of this system is that it is considerably simpler and less expensive than the full six axis optical tracker previously described. The fact that the ceiling is at a constant distance and known orientation from the HMD greatly simplifies the optical system, the quality of the required imaging device and the complexity of the subsequent image analysis. As in the previous six-axis optical tracking system, this spatial positioning information is inherently in the form of relative

movement only. However, the addition of "absolute reference points" allows such a system to re-calibrate its absolute references and thus achieve an overall absolute coordinate system. This absolute reference point calibration can be achieved relatively easily utilizing several different techniques. The first, and perhaps simplest technique is to use color sensitive retroflective spots as previously described. Alternately, active optical ~~beacon's~~ beacons (such as LED ~~beacon's~~ beacons) could also be utilized. A further alternative absolute reference calibration system which could be used is based on a bi-directional infrared beacon. Such as system would communicate a unique ID code between the HMD and the beacon, such that calibration would occur only once each time the HMD passed under any of these "known spatial reference points". This is required to avoid "dead tracking regions" within the vicinity of the calibration beacons due to multiple origin resets. --